

REMARKS

Favorable consideration and allowance of claims 13-26 are respectfully requested in view of the foregoing amendments and the following remarks.

Claim 26 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite due to instances of insufficient antecedent basis. Claim 26 is amended herein to remove the bases for the indefiniteness rejection. Accordingly, Applicants submit that claim 26, as amended, is definite.

Claims 13-22, 24 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over GB 2270130 (Goebels) in view of US 6,371,573 (Goebels et al.); claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over GB 2270130 in view of US 6,371,573, and further in view of GB 2136521 (Goebels); and claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over GB 2270130 in view of US 6,371,573, and further in view of US 6,264,289 (Franke et al.). Applicants traverse the rejections as set forth below.

In numbered paragraph 8 of the Office Action, the Examiner asserts that claims 13 and 26 do not show **(a)** how the recited wheel slip control is being carried out or **(b)** what specific structure performs the recited wheel slip control. With respect to this assertion, Applicants submit the following remarks.

Claim 13 already includes the features that

the inserted solenoid valve connects the control input of the respective relay valve with the compressed air reservoir for adapting the speed of rotation of a driven wheel, which initially slips during acceleration, to the speed of rotation of a non slipping

wheel, and the solenoid control valve assigned to the slipping wheel is controlled depending on the slip rate of the slipping wheel and a change in velocity of said slipping wheel, whereby the solenoid control valve assigned to the slipping wheel is alternatively switched back and forth between a pressure buildup position and a pressure reduction position.

From these features it is evident and clear how the recited wheel slip control is being carried out as it is specifically described how the solenoid control valve assigned to the slipping wheel and how the inserted solenoid control valve are controlled. Claim 26 includes features corresponding to the above-described features of claim 13. Therefore, **item (a)** as set forth above is already contained in claims 13 and 26.

In paragraphs [0042] and [0043] of the substitute specification, it is described that the controlling and regulating unit 72 (see page 16, line 3) controls the solenoid control valves, particularly the control of the solenoid control valve 10 or 12 which is assigned to the slipping wheel and the control of the inserted control valve 76.

Claims 13 and 26 are amended herein to explicitly include a controlling and regulating unit, thereby reciting the structure that performs the claimed wheel slip control. Support for these amendments is present, for example, in paragraphs [0042] and [0043] of the substitute specification. Claims 14, 17-19 and 25 are amended to remain consistent with claim 13. Thus, claims 13 and 26 identify the specific structure that performs the recited wheel slip control mentioned above in **item (b)**.

Applicants submit that the cited prior art does not teach or suggest all of the limitations of the claims. In particular, the prior art does not disclose the feature of claim 13 of

a controlling and regulating unit operatively configured to control the inserted solenoid control valve to connect the control input of the respective relay valve with the compressed air reservoir for adapting the speed of rotation of a driven wheel, which initially slips during acceleration, to the speed of rotation of a non-slipping wheel, and the solenoid control valve assigned to a slipping wheel is controlled by the controlling and regulating unit in a timed manner depending on the slip rate of the slipping wheel and a change in velocity of said slipping wheel, whereby the solenoid control valve assigned to the slipping wheel is alternatively switched back and forth between a pressure buildup position and a pressure reduction position by the controlling and regulating unit.

Patent document GB 22 70 130 discloses a pressure regulator module for a motor vehicle pneumatic braking system for a wheel slip dependent controlling or regulating of braking pressures applied to two separate working connections, including a two way valve assembly having one relay valve for each conduit. According to the embodiment of GB 22 70 130 disclosed in Fig. 2a, which is cited in the Office Action, a proportional valve is associated with each relay valve as a control valve. Thus, the electronic circuit for controlling such a proportional valve is provided as a rather complicated electrical regulating circuit. Furthermore, the construction of the proportional valve is very complicated and expensive. GB 22 70 130 includes no description or indication with reference to Fig. 2a, if and how a wheel slip control system (ASR) would be realized.

The only embodiment designated as suitable for wheel slip control in GB 22 70 130 is the embodiment shown in Fig. 1. This embodiment operates with two control valves 9 and 12 inserted in front of the solenoid valves 7 and 8. For wheel slip control, this means that for interferences with the brake system independent from the wishes of the driver, the solenoid valve 12 is initially switched, so that no more pneumatic control signals can be provided to the solenoid valves 7 and 8 via the control conduit 13, but only reservoir pressure via the conduit 17. As disclosed on page 13, line 25 – page 14, line 3 of GB 22 70 130, the respective solenoid valve 7 or 8 is not being timed (“not pulsed”) during wheel slip control operation, but only controlled, so that it prevents the compressed air from being supplied to the pneumatic control input of the respective solenoid valve. A person skilled in the art interprets this as switching the solenoid valve once, and leaving it in this switching position.

In contrast to this disclosure of the operation of the device in GB 22 70 130, in claim 13 of the present application “the solenoid control valve assigned to a slipping wheel is controlled by the controlling and regulating unit in a timed manner depending on the slip rate of the slipping wheel and a change in velocity of said slipping wheel.”

Furthermore, in the embodiment disclosed in Fig. 1 of GB 22 70 130, four solenoid valves with respective piping or electric wiring are being used, which requires a relatively high manufacturing and assembly effort. By contrast, claim

13 requires “only one additional inserted solenoid control valve coupled on an input side of the module” along with the two solenoid control valves assigned to the control inputs of the relay valves.

Compared to GB 22 70 130, the controlling and regulating unit claimed in claim 13 proceeds on an exactly opposite path by controlling the two solenoid control valves (e.g., elements 10 and 12 in FIG. 1) inserted in front of the two relay valves (e.g., elements 6 and 8 in FIG. 1) in a timed manner for realizing wheel slip control. GB 22 70 130 requires four solenoid valves, at least partly because the device disclosed in GB 22 70 130 does not control its solenoid control valves in a timed manner. Thus, claim 13 only requires three solenoid valves, instead of the four solenoid valves required by GB 22 70 130, for realizing wheel slip control.

The present invention provides an improvement over prior art pressure regulator modules, such as that disclosed by GB 22 70 130 with a wheel slip control system according to the embodiment of Fig. 1, so that it can be manufactured in a more simple and cost effective manner.

Additionally, US 6,371,573, which is only cited for its disclosure of 3/2-way valves, fails to make up for the above-described deficiencies of GB 22 70 130.

In view of the foregoing, Applicants submit that claim 13 is patentable over the prior art. Claims 14-22 and 24 are patentable due to their dependence from claim 13.

Claims 23 and 25 are patentable due to their dependence from claim 13, and because the tertiary references fail to make up for the above-described deficiencies of GB 22 70 130 and US 6,371,573.

Applicants submit that claim 26 is patentable for reasons analogous to those for claim 13.

Additionally, a close examination of the cited prior art documents does not lead to the result that the invention is made obvious through a combination of GB 22 70 130 and US 6,371,573. The embodiment according to Fig. 7 of US 6,371,573 relates to a braking system, in which the 3/2 way valve 55 connects the control pressure of the brake valve 61, in case of an ABS in a timed manner, to the control input of the relay valve 57 (See column 8, lines 8 to 15: "...only in the control line..."). If these teachings are transposed to the embodiment according to Fig. 1 of GB 22 70 130, the solenoid valve 12 or the solenoid valve 9, which are integrated and inserted into the pneumatic control line 13, which is run from the operating brake valve, would have to be controlled in a timed manner. This, however, does not lead to the invention.

In a wheel slip control system, controlling the brake pressures is performed independently from the control pressure generated by the operating brake valve. According to the invention, consequently not the control pressure generated by the brake operation valve, but a reservoir pressure originating from a compressed air reservoir, is connected to the control input of the respective

relay valve in a manner timed by the solenoid valves, which constitutes a substantial operational difference.

Timing the reservoir pressure for providing wheel slip control through two 3/2 way valves, however, is not known in the state of the art. Thus, the assertion that it would have been obvious to combine the teachings of U.S. 6,371,573 with GB 22 70 130 is based on an impermissible hindsight reconstruction. Therefore, claims 13-26 are patentable over the prior art for this additional reason.

In view of the foregoing, Applicants submit that the application is in condition for allowance and such action is earnestly solicited.

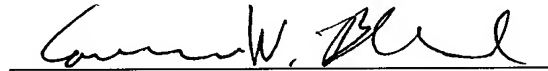
If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

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If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket # 037068.55856US).

Respectfully submitted,

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